

PU030213 (JP10304272) ON 7765

- (19) Patent Agency of Japan (JP)
(12) Official report on patent publication (A)
(11) Publication number: 10-304272
(43) Date of publication of application: 13.11.1998
(51) Int.Cl. H04N 5/445 G09G 1/00 H04N 5/44
(21) Application number: 9-122812
(22) Date of filing: 28.04.1997
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(54) Title of the invention: On-screen display device
(57) Abstract:

Problem to be solved: To provide an on-screen display device that has provision for video signals with at least two kinds of video formats.

Solution: The display device is made up of a color television system signal discrimination means 3, a 1st on-screen display(OSD) signal processing means 4 for a 1st video format, a 2nd OSD signal processing means 5 for a 2nd video format, a selector means 6, and a microcomputer 8. In this case, the microcomputer 8 selects either of the 1st and 2nd OSD signal processing means 4, 5 and provides an output of monochromatic mode command data to the one OSD signal processing means while providing an output of color mode command data to the other of the processing means 4, 5.

REF.	AE	PU030213
COUNTRY	EUROPE	
CORRES.	US/UK	

[Claims]

[Claim 1] A color television system signal discriminating means that distinguishes a video image format of an externally inputted video signal, 1st on-screen display signal processing means for the 1st video image format by which an externally inputted video signal is inputted, 2nd on-screen display signal processing means for the 2nd video image format, which is different from the mentioned above 1st video image format, by which the mentioned above externally inputted video signal is inputted, a selector means to switch and output each output signal of the mentioned above 1st and 2nd on-screen display signal processing means, a microcomputer that an alphabetic data signal is supplied to either of the mentioned above 1st or 2nd on-screen display signal processing means according to a discrimination signal from the mentioned above 1st and 2nd color television system signal discriminating means and carries out switching control of the mentioned above selector means, the above the on-screen display device and the mentioned above microcomputer, while choosing one side of the mentioned above 1st and 2nd on-screen display signal processing means and outputting color mode command data to on-screen display signal processing means of one of these, it is made to output monochrome mode command data to an on-screen display signal processing means of another side.

[Claim 2] A signal discriminating means that distinguishes a video image format of an externally inputted video signal, 1st on-screen display signal

processing means for the 1st video image format by which an externally inputted video signal is inputted, 2nd on-screen display signal processing means for the 2nd video image format, which is different from the mentioned above 1st video image format, by which the mentioned above externally inputted video signal is inputted, a selector means to switch and output each output signal of the mentioned above 1st and 2nd on-screen display signal processing means, a microcomputer that an alphabetic data signal is supplied to either of the mentioned above 1st or 2nd on-screen display signal processing means according to a discrimination signal from the mentioned above signal discriminating means and carries out switching control of the mentioned above selector means, the on-screen display device provided and an external synchronizing signal detection means to detect an external synchronizing signal in an externally inputted video signal is included further, the mentioned above 1st or 2nd on-screen display signal processing means is constituted so that it may be made to operate by internal synchronization mode and external sync mode by the mentioned above external synchronizing signal, when it stores that the mentioned above 1st or 2nd on-screen display signal processing means is external sync mode and it is switched to internal synchronization mode from external sync mode, the mentioned above microcomputer, an on-screen display signal processing means selected at the time of external sync mode is continued and it is made to choose.

[Detailed description of the invention]

[0001]

[Field of the invention] This invention relates to an on-screen display device.

[0002]

[Description of the prior art] The conventional on-screen display (OSD) device includes a digital discrimination circuit that can process the video signal of different video signal formats (for example, NTSC system and PAL system) as a video signal processing means, the superimposition function of an alphabetic data signal can be performed using OSD IC (for example, OSD IC for NTSC and OSD IC for PAL) for exclusive use, respectively.

[0003] Drawing 9 is a block diagram showing an example of the conventional OSD system. 1 is input terminal, 3 is NTSC/PAL signal discrimination circuit, 4 is OSD IC for NTSC, 5 is OSD IC for PAL, 6 is Selector switch, 7 is Output terminal, 8 is Microcomputer.

[0004] In drawing 9, the NTSC/PAL signal discrimination circuit 3 distinguishes the video signal formats of the externally inputted video signal inputted into the input terminal 1, and if it is an NTSC signal and they are a high (or low) and a PAL signal, it will output a low (or high) discrimination signal to the microcomputer 8. The microcomputer 8 with the discrimination signal from the NTSC/PAL signal discrimination circuit 3 distinguish and if an inputted video signal is an NTSC signal mode of NTSC or PAL

is used, supplying the alphabetic data signal to superimpose to OSD IC 4 for NTSC, and switch the selector switch 6 to the OSD IC 4 side for NTSC, and if an inputted video signal is a PAL signal, the alphabetic data signal to superimpose is supplied to OSD IC 5 for PAL, and switching control of the selector switch 6 is carried out to the OSD IC 5 side for PAL.

[0005] Drawing 10 is a flow chart explaining operation of the block diagram of drawing 9. the microcomputer 8 in S41 distinguishes the discrimination signal from the NTSC/PAL signal discrimination circuit 3 NTSC signal (high-level) or (low level), and it is S42, if it is yes. The selector switch 6 is switched to the NTSC side, and a color mode command signal is outputted to OSD IC 4 for NTSC by S43. If the answer of S41 is no, it will progress to S43 and the selector switch 6 is switched to the PAL side and a color mode command signal is outputted to OSD IC 5 for PAL by S44.

[0006] However, in the case of composition of performing a NTSC/PAL color mode change by switching a selector switch simply as mentioned above. From OSD IC of those who are not using it, the high color signal ingredient of frequency might interfere by the capacitive coupling between the patterns of a printed circuit board that carry the OSD circuit, and might have an adverse effect (an image bleeds) on the signal of the course of those, who are using it.

[0007] On the other hand by drawing 9, the microcomputer 8 detects the high / low level variation a NTSC/PAL change of the discrimination signal from the NTSC/PAL signal discrimination circuit 3,

distinguishes with the high or a low level of a discrimination signal and if it is a high, mode of NTSC or PAL is used. Supplying the alphabetic data signal superimposed to a video signal to OSD IC 4 for NTSC and switch the selector switch 6 to the OSD IC 4 side for NTSC, and if it is a low, the alphabetic data signal superimposed to a video signal is supplied to OSD IC 5 for PAL, and switching control of the selector switch 6 is carried out to the OSD IC 5 side for PAL.

[0008] Drawing 11 is a flow chart explaining the mentioned above operation in the block diagram of drawing 9. The microcomputer 8 is S51 first, it distinguishes whether the NTSC/PAL change was detected from the NTSC/PAL signal discrimination circuit 3 by the level variation of the discrimination signal, and it is S52 if it is yes, it distinguishes the discrimination signal from the NTSC/PAL signal discrimination circuit 3 NTSC signal (high-level) no (low level), and if it is yes, the selector switch 6 will be switched to the NTSC side by S53, and an alphabetic data signal will be outputted to NTSC side OSD 4 by S54. OSD IC 4 for NTSC to the inputted video signal inputted via the NTSC/PAL signal discrimination circuit 3. The video signal that superimposed the character image composite signal corresponding to the alphabetic data signal inputted from the microcomputer 8 is supplied to the output terminal 7 via the selector switch 6.

[0009] If the answer of S2 is no, it will progress to S5 and the microcomputer 8 switches the selector switch 6 to the PAL side, it will be S6 and will output an

alphabetic data signal to OSD IC 5 for PAL. OSD IC 5 for NTSC to the inputted video signal inputted via the NTSC/PAL signal discrimination circuit 3. The video signal that superimposed the character image composite signal corresponding to the alphabetic data signal inputted from the microcomputer 8 is supplied to the output terminal 7 via the selector switch 6.

[0010]

[Problems to be solved by the invention] However, the case (for example, when the power supply of the videocassette recorder is turned off) where there is no video signal input in the mentioned above composition distinction of NTSC/PAL signal in order not to become final and conclusive, for example, NTSC signal may be outputted using the monitor television of a PAL system as a video output and inconvenience arises.

[0011]

The purpose of this invention is to provide the on-screen display device that solved the mentioned above conventional problem.

[0012]

[Means for Solving the Problem] An on-screen display device according to this invention, a color television system signal discriminating means that distinguishes a video image format of an externally inputted video signal, 1st on-screen display signal processing means for the 1st video image format by which an externally inputted video signal is inputted, 2nd on-screen display signal processing for the 2nd video image format, which is different from means the mentioned above 1st video

image format, by which the mentioned above externally inputted video signal is inputted, a selector means to switch and output each output signal of the mentioned above 1st and 2nd on-screen display signal processing means, according to a discrimination signal from the mentioned above 1st and 2nd color television system signal discriminating means, supply an alphabetic data signal to either of the mentioned above 1st or 2nd on-screen display signal processing means.

In an on-screen display device that consists of a microcomputer that carries out switching control, the mentioned above selector means the mentioned above microcomputer, while choosing one side of the mentioned above 1st and 2nd on-screen display signal processing means and outputting color mode command data to on-screen display signal processing means of one of these, it is made to output monochrome mode command data to an on-screen display signal processing means of another side.

[0013] An on-screen display device according to this invention, a signal discriminating means that distinguishes a video image format of an externally inputted video signal and 1st on-screen display signal processing means for the 1st video image format by which an externally inputted video signal is inputted, 2nd on-screen display signal processing means for the 2nd video image format, which is different from the mentioned above 1st video image format, by which the mentioned above externally inputted video signal is inputted, a selector means to switch and output each output signal of the mentioned above 1st and 2nd on-

screen display signal processing means, according to a discrimination signal from the mentioned above signal discriminating means, supply an alphabetic data signal to either of the mentioned above 1st or 2nd on-screen display signal processing means. In an on-screen display device that consists of a microcomputer that carries out switching control of the mentioned above selector means, including an external synchronizing signal detection means to detect an external synchronizing signal in an externally inputted video signal, constitute the mentioned above 1st or 2nd on-screen display signal processing means, so that it may be made to operate by internal synchronization mode and external sync mode by the mentioned above external synchronizing signal, and the mentioned above microcomputer, when it stores that the mentioned above 1st or 2nd on-screen display signal processing means is external sync mode and switches to internal synchronization mode from external sync mode, an on-screen display signal processing means selected at the time of external sync mode is continued, and it is made to choose.

[0014] The 1st video image format is NTSC system, and the 2nd video image format is a PAL system of an on-screen display device concerning this invention.

[0015]

[Function] The color television system signal discriminating means that distinguishes the video image format of an on-screen display externally inputted video signal, 1st on-screen display signal processing means for the 1st video image format by which an externally inputted video signal is inputted, 2nd on-screen display

signal processing means for the 2nd video image format, which is different from the 1st video image format, by which an externally inputted video signal is inputted, a selector means to switch and output each output signal of the 1st and 2nd on-screen display signal processing means, according to the discrimination signal from the 1st and 2nd color television system signal discriminating means, supply an alphabetic data signal to either of the 1st or 2nd on-screen display signal processing means. In the on-screen display device that consists of a microcomputer that carries out switching control, a selector means a microcomputer, while choosing one side of the 1st and 2nd on-screen display signal processing means and outputting color mode command data to the on-screen display signal processing means of one of these, monochrome mode command data are outputted to the on-screen display signal processing means of another side.

[0016] An on-screen display device also includes an external synchronizing signal detection means to detect the external synchronizing signal in an externally inputted video signal, constituting the 1st or 2nd on-screen display signal processing means so that it may be made to operate by internal synchronization mode and the external sync mode by the mentioned above external synchronizing signal and a microcomputer, when it stores that the mentioned above 1st or 2nd on-screen display signal processing means is external sync mode and switches to internal synchronization mode from external sync mode, the on-screen display signal

processing means selected at the time of external sync mode is continued and chosen.

[0017]

[Embodiment of the invention] Drawing 1 is a block diagram showing one example of the OSD system according to this invention. 1 is Input terminal, 3 is NTSC/PAL signal discrimination circuit, 4 is OSD IC for NTSC, 5 is OSD IC for PAL, 6 is Selector switch, 7 is Output terminal, 8 is Microcomputer.

[0018] Drawing 2 is a block diagram showing an example of the internal configuration of OSD IC in drawing 1. In drawing 2, 11 is a video signal input terminal, 12 is a video amplifier, 13 and 14 are analog switches, 15 is an adding machine, 16 is a video amplifier, 17 is an output terminal, 18 is a command signal input terminal, 19 is a control part, 20 is a switching control circuit, 21 is character image composite signal generation circuits.

The control part 19 controls the switching control circuit 20 by the command signal from the command signal input terminal 18, carries out ON/OFF control of the analog switches 13 and 14 with it, and controls the character image composite signal generator 21 and makes an alphabetic data signal output to the analog switch 14. OSD IC of drawing 2 can be operated by internal synchronization mode or external sync mode (a synchronous circuit not represented).

[0019] While OSD IC is operating by external sync mode, by control of the control part 19 based on the color mode command signal from the command signal input terminal 18, the switching control circuit 20, as

the analog switch 13 is switched, so that it may be turned on and shown on drawing 3, the externally inputted video signal containing the color burst CB and the video signal V1 is supplied to the adding machine 15. The character image composite signal that includes the color burst CB and the character image signal V2 from the character image composite signal generator 21, it is made to synchronize with an externally inputted video signal according to the color burst CB, and outputs, and the superimposed output video signal is supplied to the output terminal 17 by switching the analog switch 14 between the periods T of the alphabetic data signal V2 to one and supplying the adding machine 15.

[0020] On the other hand, while OSD IC is operating in internal synchronization mode, by control of the control part 19 based on the color mode command signal from the command signal input terminal 18, the switching control circuit 20, as it switches so that the analog switch 13 may be come by off and the analog switch 14 may be turned on and shown on drawing 4 (A).

An externally inputted video signal is not outputted to the adding machine 15, but a character image composite signal is supplied to the adding machine 15 and the output terminal 17 is supplied by making only the character image composite signal into an output video signal.

[0021] When OSD IC operates in internal synchronization mode and a monochrome mode command signal is inputted into the command signal input terminal 18, by control of the control part 19, the

switching control circuit 20, as it switches so that the analog switch 13 may be come by off and the analog switch 14 may be turned on similarly, and shown on drawing 4 (B). An externally inputted video signal is not outputted to the adding machine 15, but the character image composite signal that is a monochrome signal that does not include 3.58 MHz of chromaticity signals is supplied to the adding machine 15 and the output terminal 17 is supplied by making only the monochrome signal into an output video signal.

[0022] Next, it explains based on the flow chart that returns to drawing 1 and shows drawing 5 the operation. By S1, first the microcomputer 8 with the discrimination signal from the NTSC/PAL signal discrimination circuit 3. If an inputted video signal is an NTSC signal, by S2, will distinguish which mode of NTSC or PAL is used, will switch the selector switch S6 to the NTSC side by S3. A color mode command signal is outputted to OSD IC 4 for NTSC, OSD IC 4 for NTSC is operated by external synchronization color mode and the output video signal that the character image composite signal superimposed to the externally inputted video signal is supplied to the output terminal 7.

[0023] Subsequently, by S4, the microcomputer 8 outputs a monochrome mode command signal to OSD IC 5 for PAL, OSD IC 5 for PAL is operated by an internal synchronization monochrome mode and the output video signal that consists of a character image composite signal which is a monochrome signal that does not include 3.58 MHz of chromaticity signals is

supplied to the output terminal 7. If an inputted video signal is a PAL signal, will progress to S5, switch the selector switch S6 to the PAL side by S6. A color mode command signal is outputted to OSD IC 5 for PAL, OSD IC 5 for PAL is operated by external synchronization color mode and the output video signal that the character image composite signal superimposed to the externally inputted video signal is supplied to the output terminal 7. Subsequently, by S7, the microcomputer 8 outputs a monochrome mode command signal to OSD IC 4 for NTSC, OSD IC 4 for NTSC is operated by an internal synchronization monochrome mode and the output video signal that consists of a character image composite signal which is a monochrome signal that does not include 3.58 MHz of chromaticity signals is supplied to the output terminal 7.

[0024] By making it operate, as explained above, the high color signal ingredient of frequency (3.58 MHz) can protect easily interference of the unnecessary signal to OSD IC in use from OSD IC of those who are not using it.

[0025]

[Example] Next, drawing 6 is a block diagram showing other examples of the OSD system according to this invention. In drawing 6, it has the input terminal 1 and the composition that the external synchronizing signal detector circuit 2 was added between the NTSC/PAL signal discrimination circuits 3 other than the component of the block diagram of drawing 1.

In the mentioned above composition, only when the external video image synchronized signal synchronizes, it is made to perform detection of a NTSC/PAL change and this is stored. By using this, when outputting an alphabetic data signal to OSD IC, in the case of an external synchronization, in the case of the present mode and an internal synchronization, an image change is performed in the mode detected at the end.

[0026] Drawing 7 is a flow chart explaining operation of the block diagram of drawing 6. It distinguishes whether the microcomputer 8 in S11 detects the NTSC/PAL change from the NTSC/PAL signal discrimination circuit 3 by the level variation of the discrimination signal, if it is no, work will be ended, and it is S12 if it is yes, it is distinguished with the detecting signal from the external synchronizing signal detector circuit 2 whether or not the external video signal is synchronized. The work will be ended if the answer of S12 is no, and if it is yes it is S13, it is distinguished whether the discrimination signal from the NTSC/PAL signal discrimination circuit 3 NTSC signal (high-level) no (low level), and by S14, if it is yes, the selector switch 6 is switched to the NTSC side, an alphabetic data signal is outputted to NTSC side OSD 4 by S15, and it stores that it is in NTSC mode in S16 now. If the answer of S13 is no, it will progress to S17, and the selector switch 6 is switched to the PAL side, an alphabetic data signal is outputted to OSD IC 5 for PAL by S18, and it stores that it is in PAL mode in S19 now.

[0027] By making it operate, by internal synchronization mode and the external sync mode by the mentioned above external synchronizing signal, as explained above, OSD IC 4 and 5 operate, and the microcomputer 8, since it has stored that OSD IC 4 or 5 is external sync mode, for example, connect the monitor television for NTSC to the output terminal 7, and an NTSC system video signal is inputted into the input terminal 1, OSD IC 4 for NTSC is continued and chosen even when using it, choosing OSD IC for NTSC, and an external video input signal is lost and it switches to internal synchronization mode, the fault by which a PAL-system video signal will be supplied to the monitor television for NTSC is lost.

[0028] Similarly, connect the monitor television for PAL to the power terminal 7, and a PAL-system video signal is inputted into the input terminal 1, since OSDIC 4 for PAL is continued and chosen even when using it, choosing OSD IC for PAL, and an external video input signal is lost and it switches to internal synchronization mode, the fault by which an NTSC system video signal will be supplied to the monitor television for PAL is lost.

[0029] Next, the OSD system shown on drawing 6 as other example, for example, about the case where it carries in the RDS/RBDS radio set that can operate in the RDS (radio data system) mode that is a radio broadcast system of Europe, and both the modes of RBDS (radio broadcasting data system) that is an American radio broadcast system. The operation is explained based on the flow chart shown on drawing 8.

[0030] First, the microcomputer 8 in S21 distinguishes whether the NTSC/PAL change was detected from the NTSC/PAL signal discrimination circuit 3 by the level variation of the discrimination signal, if it is no, work will be ended, and it is S22 if it is yes, it is distinguished with the detecting signal from the external synchronizing signal detector circuit 2 whether or not the external video signal is synchronized. The work will be ended if the answer of S22 is no, and if it is yes it is S23, it is distinguished whether the discrimination signal from the NTSC/PAL signal discrimination circuit 3 NTSC signal (high-level) no (low level), and by S24, if it is yes, the selector switch 6 is switched to the NTSC side by S25, an alphabetic data signal is outputted to NTSC side OSD 4, it stores that it is in NTSC mode in S26 now, and the RDS/RBDS mode of a radio set is switched to RDS mode by S27.

[0031] If the answer of S23 is no, will progress to S28 and the microcomputer 8, the selector switch 6 is switched to the PAL side, by S29, an alphabetic data signal is outputted to OSD IC 5 for PAL, it stores that it is in PAL mode in S30 now, and the RDS/RBDS mode of a radio set is switched to RBDS mode by S31.

[0032] By making it operate, as explained above, a radio set, since it is switched to RBDS mode when it is switched to RDS mode when the OSD system operates with NTSC system, and the OSD system operates with a PAL system, a color television system can respond to both the Europe which is PAL system, and the U.S. whose color television system is a NTSC system.

[0033] As mentioned above, although the example of this invention was described, not only these examples but various change is possible. For example, although NTSC and PAL were explained as a video image format, other video image formats are feasible similarly.

[0008]

[Effect of the invention] According to this invention, the OSD system that can respond to the video signal of at least two kinds of video image formats is obtained.

[Brief description of the drawings]

[Drawing 1] is a block diagram showing one example of the OSD system according to this invention.

[Drawing 2] is a block diagram showing an example of the internal configuration of OSD IC in drawing 1.

[Drawing 3] is a signal waveform diagram at the time of the external sync mode in an OSD system.

[Drawing 4] (A) is a signal waveform diagram at the time of the internal synchronization mode in an OSD system and (B) shows the time of a monochrome mode at the time of color mode.

[Drawing 5] is a flow chart explaining operation of the block diagram of drawing 1.

[Drawing 6] is a block diagram showing other examples of the OSD system according to this invention.

[Drawing 7] is a flow chart explaining operation of the block diagram of drawing 6.

[Drawing 8] is a flow chart that shows the operation at the time of carrying the OSD system shown on drawing 6 in a RDS/RBDS radio set.

[Drawing 9] is a block diagram showing an example of the conventional OSD system.

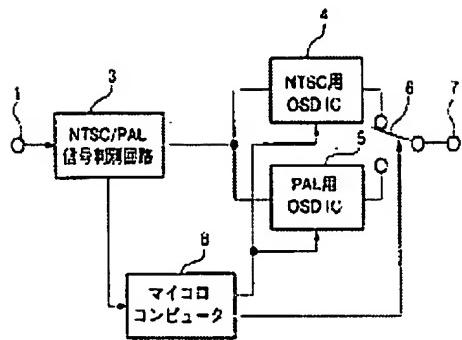
[Drawing 10] is a flow chart explaining operation of the block diagram of drawing 9.

[Drawing 11] is a flow chart explaining operation of the block diagram of drawing 9.

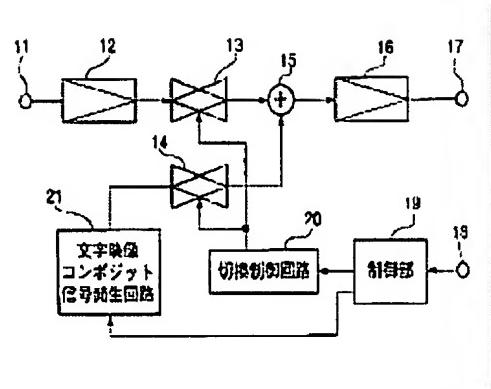
[Description of numbers]

- 1 Input terminal
- 2 External synchronizing signal detector circuit
- 3 NTSC/PAL signal discrimination circuit
- 4 OSD IC for NTSC
- 5 OSD IC for PAL
- 6 Selector switch
- 7 Output terminal
- 8 Microcomputer
- 11 Video signal input terminal
- 12 Video amplifier
- 13 Analog switch
- 14 Analog switch
- 15 Adding machine
- 16 Video amplifier
- 17 Output terminal
- 18 Command signal input terminal
- 19 Control part
- 20 Switching control circuit
- 21 Character image composite signal generation circuit

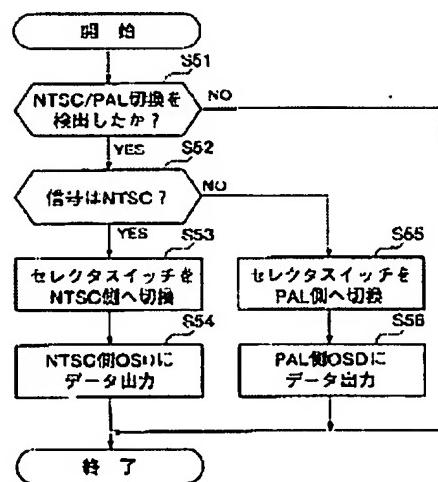
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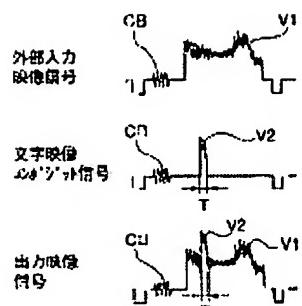
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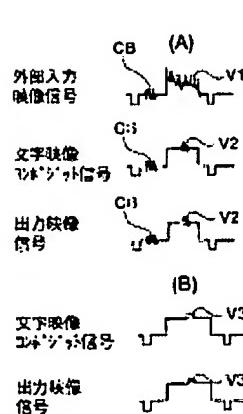
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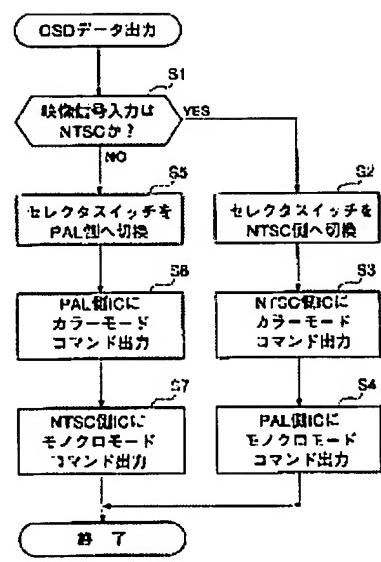
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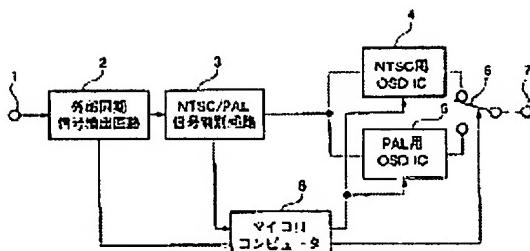
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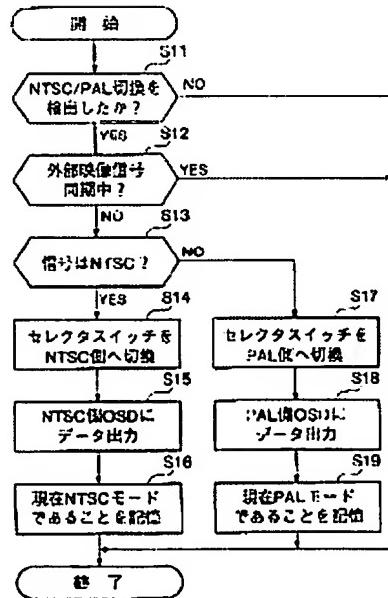
Drawing 5



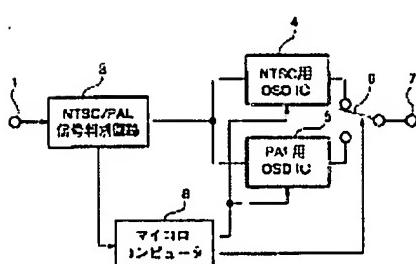
Drawing 6



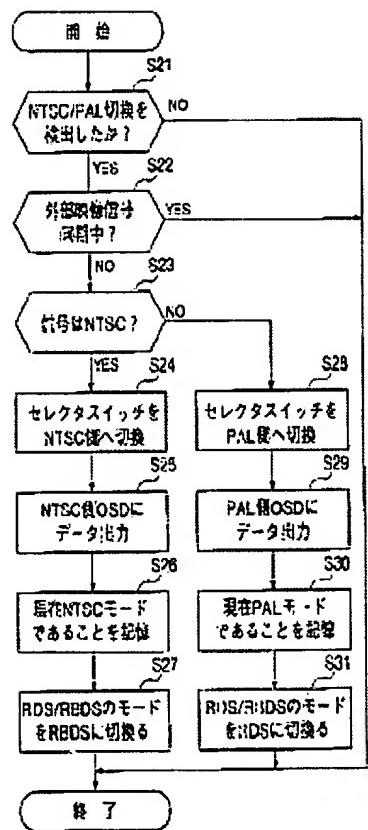
Drawing 7



Drawing 9



Drawing 8



Drawing 10

